

PRITCHARDIA AND COCOS IN THE HAWAIIAN ISLANDS  
Otto & Isa Degener

When the Hawaiian Islands were rediscovered by Captain James Pace Cook in 1778, only two genera of palms grew in the archipelago. The one was Pritchardia, consisting of many taxa of fan-leaved or palmate palms; the other, Cocos, consisting of a single species of feather-leaved or plumose palm. Odoardo Beccari and Joseph F. Rock in 1921 published their beautifully illustrated work entitled \*A Monographic Study of the Genus Pritchardia, 1-77. It is the last, authoritative work on the group. Though we know it conceals errors, we do not yet know enough to correct them. The species are native mostly to Micronesia and Polynesia, attaining their major development in the Hawaiian Archipelago. They grow from sea level to about 5,000 feet elevation; from desert to dense rainforest. According to Beccari & Rock's findings, there are about 25 species and five varieties extending from the Island of Hawaii westward to distant Nihoa. Since 1921 additional taxa have been described, some of questionable validity.

Beccari & Rock describe as new, single individual palm trees growing in hot, lowland gardens, and not known anywhere in the wild. Could not such individual palms be the offspring of seeds collected in the rainy mountains of our islands? Do they merely look new because they are growing under greatly changed conditions? We do not presently know.

One of our local botanists, Dr. Harold St. John, collected specimens from a single palm in the mountains near Punaluu, Oahu and, using the monograph, keyed it to a certain species. At a different season he visited the identical palm, collected additional material and, using the same key, came to an entirely different species! Obviously, something is wrong somewhere.

While botanizing for five months in 1928 on Molokai, the kane writer searched for Pritchardia, known to Hawaiians as loulu, and noted some growing cultivated near the coast in the garden of an elderly Hawaiian known to him as Levi. From his part-Hawaiian assistant, in whom Levi had confided, he learned that Rock had heard about loulu palms growing in some Molokai fastness. He offered Levi pay to fetch him specimens. As Rock refused the price Levi wanted, Levi resolved to have his cake and eat it too. So he agreed to Rock's more modest offer but, instead of climbing the mountain range to get specimens of the elusive palm, he merely substituted material from one of the trees in his yard. Levi thought it a great

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\*Mem. B.P. Bish. Mus. 8(1).

joke, and chuckled while telling the writer's assistant about the deception. Evidently some Molokai taxon is listed erroneously in the monograph as to habitat.

We see no way of greatly revising Beccari & Rock's work, excellent for the time and conditions under which it was produced, without concentrating on collecting herbarium specimens from all colonies still extant, a task easily facilitated by airplane spotting of these conspicuous trees. Seeds from each colony, preferably from the same palm from which voucher material had been preserved, should then be planted under uniform conditions with similarly procured seeds from other colonies. Such cultivated plants must then be compared with one another when they finally flower and fruit, as well as against the vouchers collected from the parent plants many years before. The difficulty of such a project is the gathering of material so often growing in almost inaccessible jungles and on cliffs, the acreage needed for the tests, the length of time before a seedling finally matures to produce diagnostic characters of flower and fruit, and the pathetic fact that so many of such distinctive colonies already have succumbed to the bulldozing "progress" of so-called civilized man. The investigator will not be sure if the old, historical specimens collected by Rock and others had not come from such colonies that are now extinct. Even though the task of getting order out of chaos seems hopeless, Foster Botanical Garden under Director Paul R. Weissich has made a good beginning.

If the above preamble is correct, it is obvious that many kinds of loulou are endemic to the Hawaiian Islands, even though no one yet knows how many species and varieties existed here in 1778. It is also plain that this genus must have been in the Hawaiian Islands for eons - certainly before the arrival of the Polynesians - to enable it to speciate to such an extent.

The fossil record certainly proves the antiquity of the loulou. Until recent bulldozing on Oahu destroyed them, erect molds of the trunks were observable on the north side of the road leading mauka to the U.S. Army Tripler General Hospital. Such palms were thriving until the lower parts of their smooth trunks were buried by the rain of ash that fell during the explosions that formed Salt Lake Crater.

On the Island of Hawaii at Kailili, near Wahaula within Hawaii Volcanoes National Park, a few impressions of prostrate trunks can be seen on a prehistoric though not very old pahoehoe lava flow. Beyond the southwestern boundary of the National Park, between the main road and the ocean, at \*Kawaa, lies an expanse of prehistoric, smooth pahoehoe.

\*Incorrectly spelled "Kawa" on some Government maps.

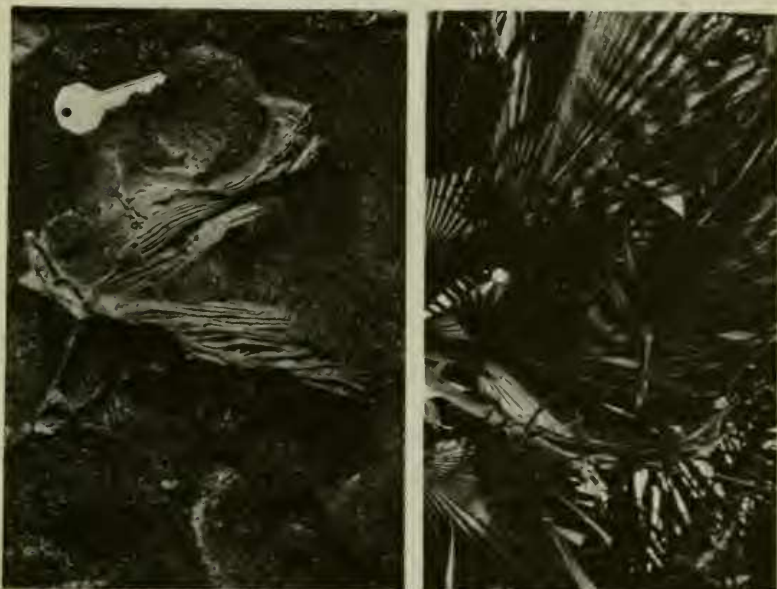
Armed with camera, broom, whiskbroom and trowel, the writers and Mr. & Mrs. Theodore L. Picco fanned over the area. Here the pahoehoe had gently flowed through a palm grove, the wet trunks burning slowly through the base so that the trees fell helter skelter upon the cooling lava. Several score impressions were carefully examined, all showing the relatively smooth, unbranched outline of a side of the palm trunk (Fig. a). Many also showed rectangular checks formed as the lava oozed into the charring wood (Figures b, c). One impression even showed the base of a fan-like blade (Fig. d),



Figures a,b,c. Trough-like *Pritchardia* tree molds, c at left showing impressions of checked charcoal.



resembling that of a modern Pritchardia (Fig. e) now growing at nearby Punaluu. Not a single trunk impression exhibited leaf scars. No palm fruits nor seeds were observed.



Fossil (Fig. d) and modern (Fig. e) leaf blades.

"According to tradition, at least the large-fruited type of coconut known as niupolapola was brought to the Hawaiian Islands by the early Polynesian immigrants from Bolabola, an island not far from Tahiti. Before Captain Cook's coming the Hawaiians knew also a few other kinds, such as the niuhiwa with dark-colored fruit and the niulelo with yellowish fruit."\* The fruit was both food and drink for the Polynesian voyagers, and certainly the most necessary and efficient supply of a potable liquid in transportable form for a long ocean voyage. We surmise some coconuts escaped being consumed, and were planted in the newly discovered islands.

Between Kawa Bay and the boundary of the National Park is the coastal village of Punaluu. Just back of the black sand beach is a mixed grove of loulou (Pritchardia affinis Beccari) and niu or coconut (Cocos nucifera L.) palms. The

\*Degener, O., Plants Haw. Nat. Park, 72. 1930.



former, a fan palm, bears erect, slender trunks hardly thickened at base and without prominent leaf scars. The latter, a feather palm, bears a curving trunk thickened at base and somewhat constricted at the prominent leaf scars. The contrast is well shown in figures f and g. with these differences in mind, the reader should compare the photographs of the living trees with those of the fossils.



Figures f and g showing two coconut palm trunks with prominent leaf scars and several Pritchardia trunks with obscure leaf scars.

In conclusion, the writers are convinced that the loulou reached the Hawaiian Islands some eons ago, and may have even more or less encircled many stretches of the Islands with extensive groves, particularly before the Polynesians brought the pig and, perhaps as stowaway, the seed-eating Polynesian rat. The fossil impressions at Kailiili and above all at Kawaa are irrefutable proof of this fact. These beautiful palms may well have extended along the shore of Hawaii Volcanoes National Park, and hence deserve replacement. Regarding the coconut, however, we consider it a newcomer to the Hawaiian Islands until irrefutable evidence to the contrary appears. Tradition bolsters this belief as well as the fact that no fossil imprints of a coconut palm have ever

been seen, not even at Kawaa Bay where conditions were ideal for its growth and fossilization.

Many have been confounded by the loulou growing in such isolated localities. It is of course possible that those trees perched on cliffs reached there as fruits falling or washing down from the plateau forest above. Or a grove may have existed for ages on a plateau before this was slowly eroded into gulches and finally into cliff-flanked canyons. The grove of palms simply continued to grow in the same spot from generation to generation, first on gulch sides and finally on the resultant cliffs. All this is possible, but is it probable? On the Island of Hawaii lives the native crow alala (Corvus tropicus Gmelin). To be sure all crows are black; but this one, as the kane writer observed in 1927 in the Kona jungle, is unique in keeping its bill agape to exhibit to its mate the beautiful akala-berry-red surface within. Evidently the ancestors of such a species, now so distinctive, must have come to the Archipelago eons ago. Today the species is on the verge of extinction, perhaps less than a dozen individuals persisting on the Island of Hawaii. In 1891, however, when the ornithologist George C. Munro surveyed this island for birds "the alala was numerous. They were in flocks - -." Perhaps crows and/or other large, seed eating birds were numerous also on some of the remaining islands and aided in the early distribution of the loulou. If "civilized" man could just about exterminate the crow on the Island of Hawaii from flocks to perhaps less than a dozen individuals in eighty years, what could not the natives have accomplished during the past few thousand? We know "The Hawaiians snared the crow and used the black feathers for kahilis and for dressing idols."

There is hope for the preservation of the Pritchardia molds because these and the archaeological features of the general area can be of value to the lucrative tourist industry. Besides having these easily accessible and clear, prostrate tree molds, the Kawaa region is flanked to the northeast by the ruins of the massive Keeku heiau or temple. This must have catered to a large neighboring population attracted by the beach and the nearby freshwater springs. Unfortunately the many house sites have been washed flat by the tsunami of 1868; but ilili, or smooth water-worn pebbles from the beach and from the flooring of the huts, are scattered everywhere. One even finds evidence of ancient pleasures and industry. Here and there, pecked into flat, smooth lava are the depressions of the papamu, or checkerboard (Fig. h), upon which the Hawaiians played konane with white coral pebbles against black lava ones; and along the rocky coast are cup-like depressions ("baitcups") in which the natives pounded their churning material used

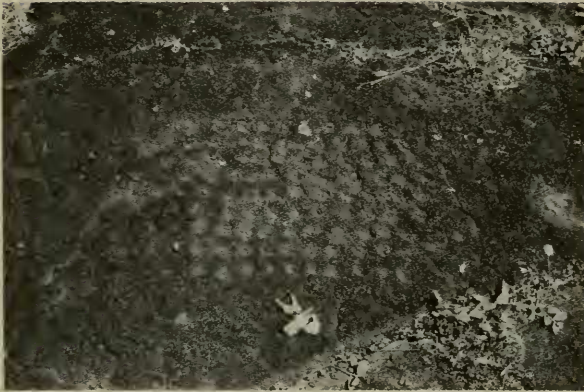


Fig. h, a papamu.

for luring fish. A few stone "salt pans" in which seawater was evaporated to gain salt for barter with upland residents are also there. Such an area rich in Hawaiiana and fossils may well escape destruction.

We are grateful to Mr. & Mrs. Picco for helping us sweep and for taking the photographs.